

APPENDIX P: BEST MANAGEMENT PRACTICES FOR FUGITIVE DUST CONTROL

The Wyoming Department of Environmental Quality (DEQ), Air Quality Division (AQD), is responsible for regulating air quality in Wyoming. The Bureau of Land Management (BLM), Rawlins Field Office (RFO), is responsible for implementing management actions that ensure compliance with the DEQ's air quality regulations, through the use of Best Management Practices (BMPs) and site specific requirements to alleviate air quality impacts considered on a case-by-case basis (BLM 2008).

The purpose of this dust control plan is to:

1. identify sources of fugitive dust that can contribute to the degradation of both air and water quality and can affect palatability of forage for livestock and wildlife; and
2. to recommend fugitive dust control measures that can be implemented to minimize or eliminate the potential for air and water pollution as a result of fugitive dust.

In certain circumstances, on a case-by-case basis, specific requirements (not necessarily limited to the BMPs recommended in this plan) will be identified by the BLM, and Operators must comply with the measures. For example, in areas with high wildlife use, vegetation may be affected by dust. In these areas, specific dust control measures may be attached to an APD as a Condition of Approval (COA) to reduce impacts to forage palatability and therefore, wildlife. The use of chemical stabilizers must be approved by the BLM prior to application.

Fugitive Dust Sources

Fugitive dust is defined as particles lifted into the ambient air caused by man-made and natural activities such as the movement of soil as a result of vehicles, equipment, blasting, and wind. This excludes particulate matter emitted directly from the exhaust of motor vehicles and other internal combustion engines; from portable brazing, soldering, or welding equipment; and from pile drivers (EPA 1995). Dust is generated through the abrasion of soils as a result of mechanical force (i.e. wheels, bulldozers) and through the entrainment of dust particles in turbulent air currents (i.e. wind erosion from a spoils stockpile).

Fugitive dust sources in the CD-C project area include vehicular traffic on unpaved roads, spoil and topsoil piles, heavy construction operations, and areas with cleared vegetation.

The primary factors that affect the quantity of fugitive dust emitted from unpaved roads include vehicle speed, number of wheels per vehicle, number of vehicles, vehicle weight, particle size distribution of the surface material, restraint of the surface fines (compaction, cohesiveness/bonding), and durability of the road surface. Meteorological conditions also affect the volume of dust, as does the placement of well pads, roads, pipelines, soil stockpiles, and ancillary facilities in relation to the prevailing wind direction.

Fugitive dust is a concern during all phases of a well's life-cycle, and during the construction and reclamation of a pipeline. In addition, the construction and use of roads constitute major sources of fugitive dust in the project area.

Fugitive Dust Control Measures 1: Before Construction

Prior to construction, dust control can be implemented through the use of proper planning, which would include the minimization of surface disturbance through minimizing the size of well pads, pipeline rights-of-way, and road rights-of-way. The utilization of existing roads and disturbance can minimize the potential for fugitive dust through the overall reduction in surface disturbance. Proper planning can also result in reduced fugitive dust through proper placement of facilities, roads, pipelines, and well pads,

potentially in areas where the soil type is less conducive to wind erosion or through the construction of well pads in areas that are naturally wind-protected. Pre-planning where spoil and soil stockpiles are constructed, perhaps in less windy areas, may reduce the potential for wind erosion and thus loss of valuable topsoil and spoil material.

In addition to construction pre-planning, carpooling and other methods to reduce traffic volume (i.e. man camps) could be implemented as part of an overall plan (EPA 1992). Traffic speed limits could be set cooperatively through the use of Road Maintenance Agreements (RMAs) that are implemented by Operators.

Pre-planning the application of surface treatments (discussed in detail below) is important to the efficacy of the treatments. The application of wet suppression or chemical stabilizers during a cool, wet time period may not result in any increased effect of the treatment. Rather, the application of treatments during drier, warmer periods, when fugitive dust is more likely, would have the greatest impact. The application of suppressants should occur at a sufficient frequency, quantity, and depth, especially on hot, dry days. Operators should consider meteorological conditions, such as wind speed, when planning surface treatments. The application of suppressants should occur prior to high winds, and, if necessary, operations should be halted during extremely high wind events.

Fugitive Dust Control Measures 2: During and After Construction

Roads

Surface improvements can be implemented to control fugitive dust, and include such measures as paving or surfacing the road with another material with a lower silt content than the existing road base (EPA 1992). Depending on the material, grading and spot reapplication of the surfacing material may be required. In addition, road fabrics can be used as resurfacing material. For roads with a lower volume of use, maintaining a vegetative cover may be practicable in certain ecological areas.

Surface treatments require periodic reapplications, and include either the use of wet suppression or chemical stabilization. Wet suppression generally includes the use of water to control dust, possibly with the addition of surfactants or other additives, but does not chemically alter the road surface. Chemical stabilization changes the physical characteristics of the road surface. Reapplication necessity may range from several minutes for water to several months for chemicals (EPA 1992).

The efficacy of wet suppression is dependent on the amount of water applied per unit area, the time between applications, traffic volume during that time period, and prevailing meteorological conditions during the period. Chemical stabilization can either simulate a wet surface or a paved surface through either attracting and retaining moisture or by cementing loose material into the surface, respectively (EPA 1992). It is recommended that diluted treatments be reapplied every month to maintain effectiveness.

Fugitive dust generated from roads can also be reduced through the use of carpooling, reduced vehicle speeds, and reduced site visits through the use of remote well monitoring, when feasible. Only established routes should be used, and, if necessary, gravel or paved exits should be established to help remove soil and mud from vehicle tires.

General Surface Disturbance

Water (or chemical stabilizers, as appropriate) should be applied prior to, during, and after earth-moving operations.

Pipelines

Pipeline dust control can be implemented through the use of wet suppression and rapid reclamation. Chemical stabilizers should not be used on pipelines as they may interfere with the ability of vegetation to colonize the site.

Storage Piles (Topsoil and Spoil Stockpiles)

Good work practices can affect the severity of wind erosion; for example, loading and unloading of soils can be confined to the downwind side of the pile. Wet suppression should be used to control fugitive dust off of the pile. Chemical stabilizers are not recommended, as they may hinder successful reclamation. For piles that will be onsite for longer periods of time, seeding with appropriate vegetation may reduce wind erosion if a successful vegetative cover is achieved. Wind barriers (such as snow fences) may also be appropriate in some situations.

Conclusions

Natural vegetative cover is the most effective method of controlling wind erosion. Therefore, the successful implementation and achievement of both interim and final reclamation of pipelines and well pads would be the most effective way to reduce wind erosion.

The control of fugitive dust from roads is an ongoing challenge that must be addressed through proper and appropriate planning and enforced through the application of appropriate stabilizers and suppressants.

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References Cited

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